

Claims

What is claimed is:

1. An antenna apparatus comprising:

a ground member having a length along a predetermined directional axis, the length being about a quarter or more of a wavelength of an electromagnetic wave used for communication; and

an antenna element extending in a direction substantially orthogonal to the directional axis and connected to the ground member.

2. The antenna apparatus according to Claim 1, wherein:

the antenna element is disposed substantially in the same plane as an end portion of the ground member with a predetermined distance provided therebetween.

3. The antenna apparatus according to Claim 1, wherein:

the antenna element comprises an antenna element main body and a feeder terminal; and

the antenna element main body and the feeder terminal cooperatively form a 1/4-wavelength inverted F antenna.

4. The antenna apparatus according to Claim 1, wherein:

the ground member further comprises a shielding member for shielding an electronic circuit.

5. The antenna apparatus according to Claim 1, wherein:

the ground member and the antenna element further comprise one piece.

6. A printed wiring board comprising:

a ground member having a length along a predetermined directional axis, the length being about a quarter or more of a wavelength of an electromagnetic wave used for communication; and

an antenna element extending in a direction substantially orthogonal to the directional axis and connected to the ground member;

wherein the ground member and the antenna element are printed wirings.

7. The printed wiring board according to Claim 6, wherein:

the antenna element is disposed substantially in the same plane as an end portion of the ground member with a predetermined distance provided therebetween.

8. The printed wiring board according to Claim 6, wherein:

the antenna element comprises an antenna element main body and a feeder terminal, and

the antenna element main body and the feeder terminal cooperatively form a 1/4-wavelength inverted F antenna.

9. The printed wiring board according to Claim 6, wherein:

the ground member and the antenna element further comprise one piece.

10. A printed circuit board comprising:

a printed wiring board;
an electronic circuit disposed on the printed wiring board;
a ground member having a length along a predetermined directional axis, the length being about a quarter or more of a wavelength of an electromagnetic wave used for communication; and
an antenna element extending in a direction substantially orthogonal to the directional axis and connected to the ground member.

11. The printed circuit board according to Claim 10, wherein:

the antenna element is disposed substantially in the same plane as an end portion of the ground member with a predetermined distance provided therebetween.

12. The printed circuit board according to Claim 10, wherein:

the antenna element comprises an antenna element main body and a feeder terminal, and

the antenna element main body and the feeder terminal cooperatively form a 1/4-wavelength inverted F antenna.

13. The printed circuit board according to Claim 10, wherein:

the antenna element and the ground member further comprise one piece.

14. The printed circuit board according to Claim 10, wherein:

the antenna element further comprises a printed wiring on the printed wiring board; and

the ground member is a separate component from the printed wiring board.

15. The printed circuit board according to Claim 13, wherein:

the ground member further comprises a shielding member for shielding the electronic circuit.

16. The printed circuit board according to Claim 15, further comprising:

a ground pattern formed on the printed wiring board and electrically connected to the ground member.

17. The printed circuit board according to Claim 10, wherein:

the antenna element and the ground member further comprise printed wirings on the printed wiring board.

18. A communication adapter comprising:

a printed wiring board;

an electronic circuit disposed on the printed wiring board;

a ground member having a length along a predetermined directional axis, the length being about a quarter or more of the wavelength of an electromagnetic wave used for communication;

an antenna element extending in a direction substantially orthogonal to the directional axis and connected to the ground member; and

a connector connection terminal;

wherein the connector connection terminal is disposed on a side toward which an antenna element main body of the antenna element extends in relation

to the printed wiring board.

19. The communication adapter according to Claim 18, wherein:
 - the antenna element further comprises a feeder terminal, and
 - the antenna element main body and the feeder terminal cooperatively form an inverted F antenna.
20. Portable electronic equipment comprising the antenna apparatus according to Claim 1.
21. The portable electronic equipment according to Claim 20, wherein
 - the portable electronic equipment further comprises a wrist watch.
22. The printed circuit board according to Claim 14, wherein:
 - the ground member further comprises a shielding member for shielding the electronic circuit.
23. The printed circuit board according to Claim 22, further comprising:
 - a ground pattern formed on the printed wiring board and electrically connected to the ground member.